



European Middleware Initiative (EMI)

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Outline

- What is EMI?
- EMI Vision and Objectives
- How does it work?
- EMI and UNICORE
- Conclusions



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EMI Mission Statement

The European Middleware Initiative (EMI) project represents a close collaboration of the major European middleware providers - ARC, gLite, UNICORE and dCache - to establish a sustainable model to support, harmonise and evolve the grid middleware for deployment in EGI, PRACE and other distributed e-Infrastructures

FP7 Program

FP7 Capacities Work Programme 2010: Infrastructures

Call **FP7-INFRASTRUCTURES-2010-2**

Sub-topic: 1.2.1.3 – Middleware and repositories

Develop middleware that strengthens European presence by consolidating or even going beyond existing DCIs (e.g. exploiting emerging developments like virtualisation), while improving their stability, reliability, usability, functionality, interoperability, security, management, monitoring and accounting, measurable quality of service, and energy efficiency

Starting date: May 1st

Duration: 3 years

Total budget: 23M € (12M € from EC + 11M € from partners)

Effort: 64 FTEs/year (88% for technical activities)

Primary Objectives

Consolidate

Consolidate the existing middleware distribution simplifying services and components to make them more sustainable (including use of off-the-shelf and commercial components whenever possible)

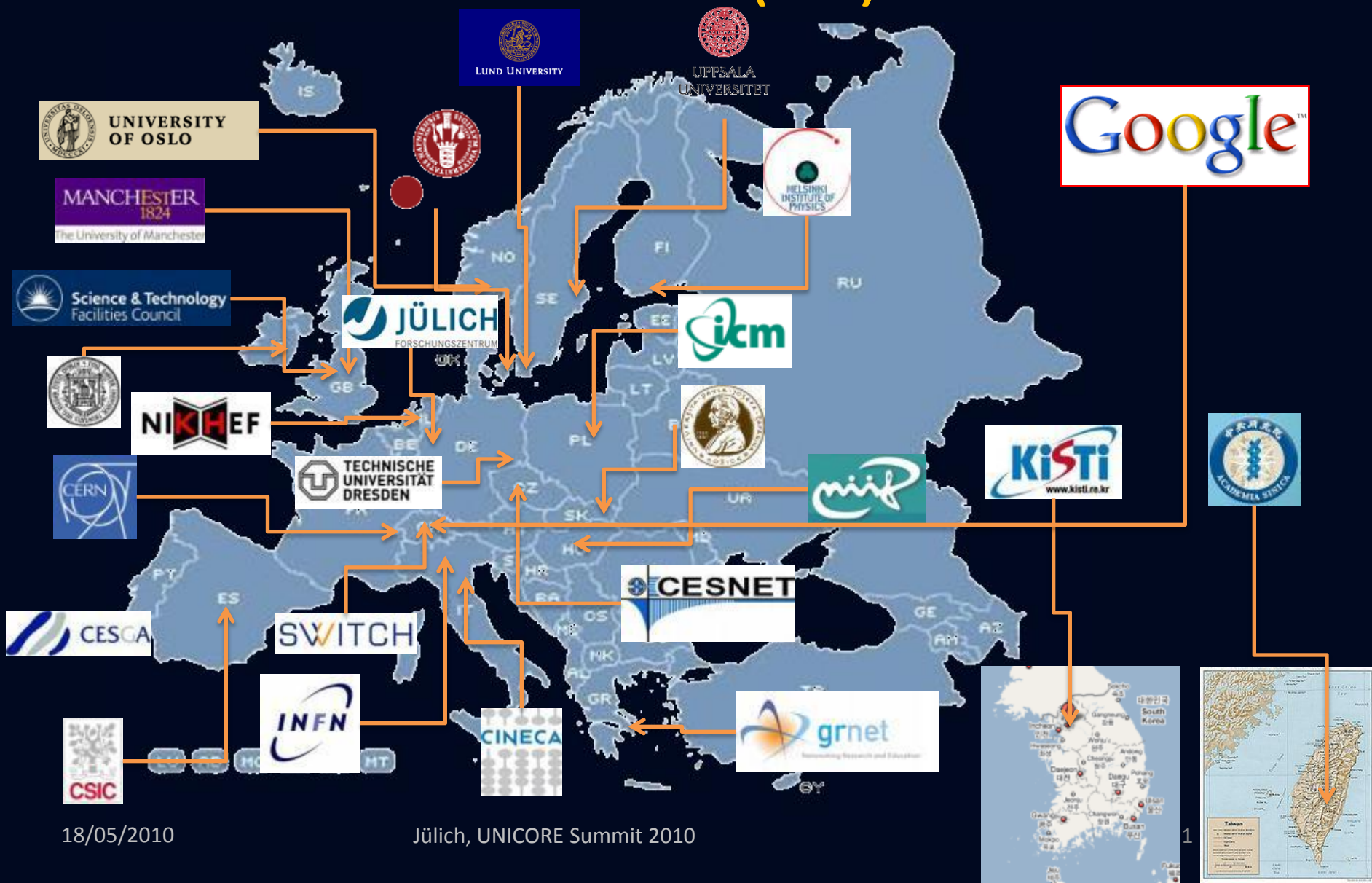
Evolve

Evolve the middleware services/functionality following the requirement of infrastructure and communities, mainly focusing on operational, standardization and interoperability aspects

Support

Reactively and proactively maintain the middleware distribution to keep it in line with the growing infrastructure usage

Partners (24)

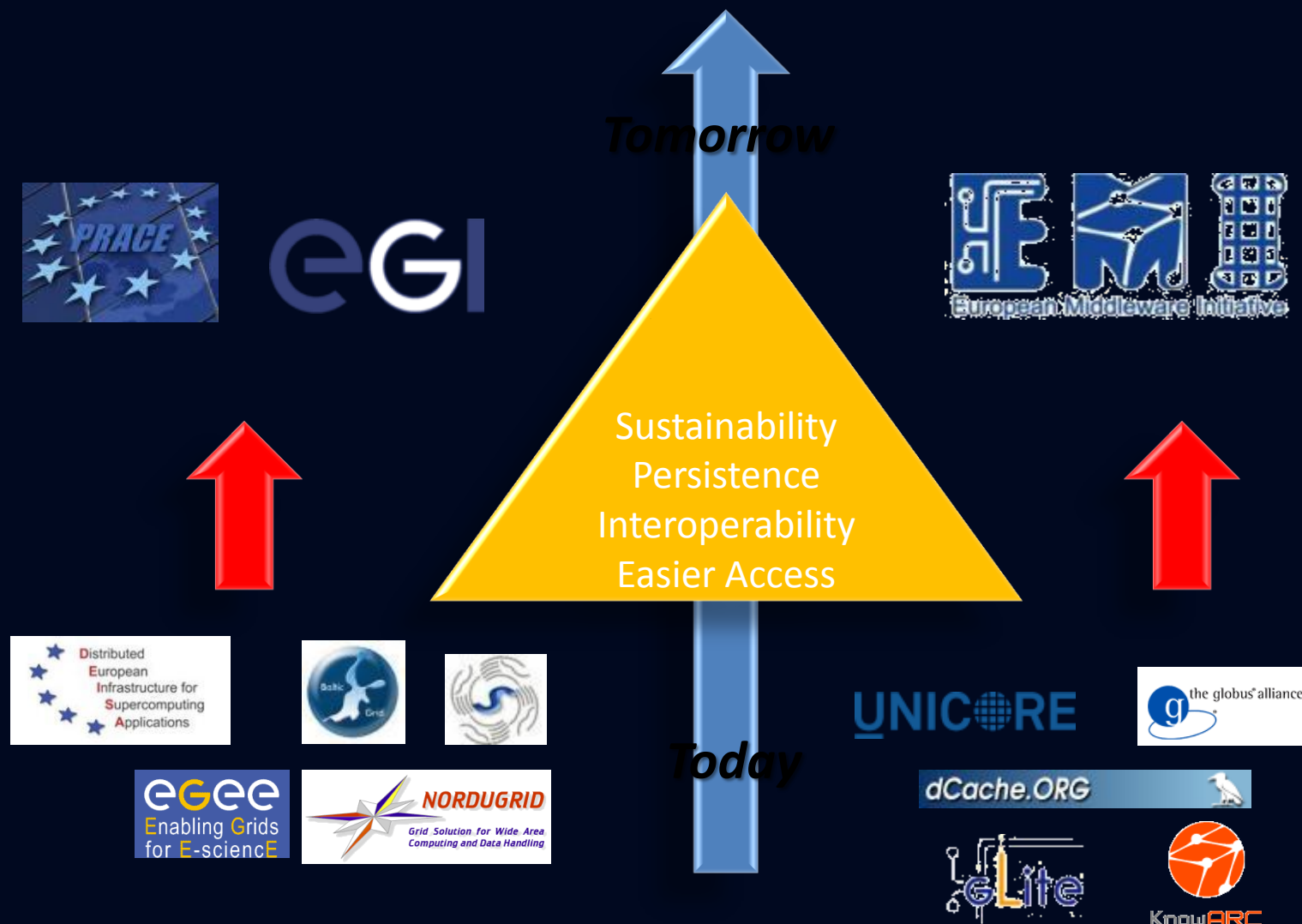


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A European Vision



Increased Usability

- One of the major complaints of research users about the middleware is about its limited “userfriendliness”
 - Deployment, configuration, service management, interoperability, security mechanisms, flexibility, etc.
- Unnecessary duplication of services and libraries
- User requirements (ESFRI, VRCs)
 - EMI is requirement driven and will actively participate to the definition of user requirements with the major user communities and infrastructures

Security

- One of the most important and most difficult aspects of the middleware
 - **Usability**: existing certificate-based technologies are needed, but too complex to manage or use for the typical user or not easy to integrate in existing security contexts
 - **Reliability**: the increasing use of distributed computing and the handling of sensitive data require reliable and auditable security methods
 - **Interoperability**: the chosen methods must be common across all services and implementations

Standardization

- Very important to address a number of existing limitations
 - Interoperability, integration, extensibility and evolution, commercial usage
- All services must:
 - Implement the 'best' relevant standards
 - Implement them in the same way
- 'Best' means:
 - A 'community' standard, if it is useful, usable or can be realistically improved
 - A 'de facto' standard, if no community standard exists or what exists is clearly not usable

Standardization

- EMI intends to be an active player in the standardization process
 - Actively take part in the European standardization roadmap coordinated by the European Commission and by initiatives like SIENA
 - Actively take part in established international standardization bodies like OGF

Interoperability

- One of the major requirements of most user communities
 - Interoperability between different implementations of the same services or functionality
 - Interoperability among HTC and HPC
 - Interoperability between different infrastructures
- Also in this case, the widespread and formally correct adoption of standards is of primary importance

Integration with New Technologies

- Technology evolves continually
- Distributed computing middleware must be able to capitalize on past achievements, but also learn from past lessons and become increasingly efficient and flexible
- Using labels like Grids or Clouds is misleading
- How can existing **stable**, **reliable** and **secure** services be made more **elastic**, **dynamic**, **efficient**?
- And again, standards are very important

Innovation

- Innovation is a key driver behind EMI
- New services or functionality are introduced **as needed** based on:
 - New user requirements
 - Need to evolve existing services or replace older technologies to support the growing infrastructures
 - Special focus on integration of virtualization, monitoring interfaces, messaging, support for portals and gateways
- **Stability** of the existing infrastructure operations must be guaranteed
 - Agreed migration timelines and paths

Industrial Relationships

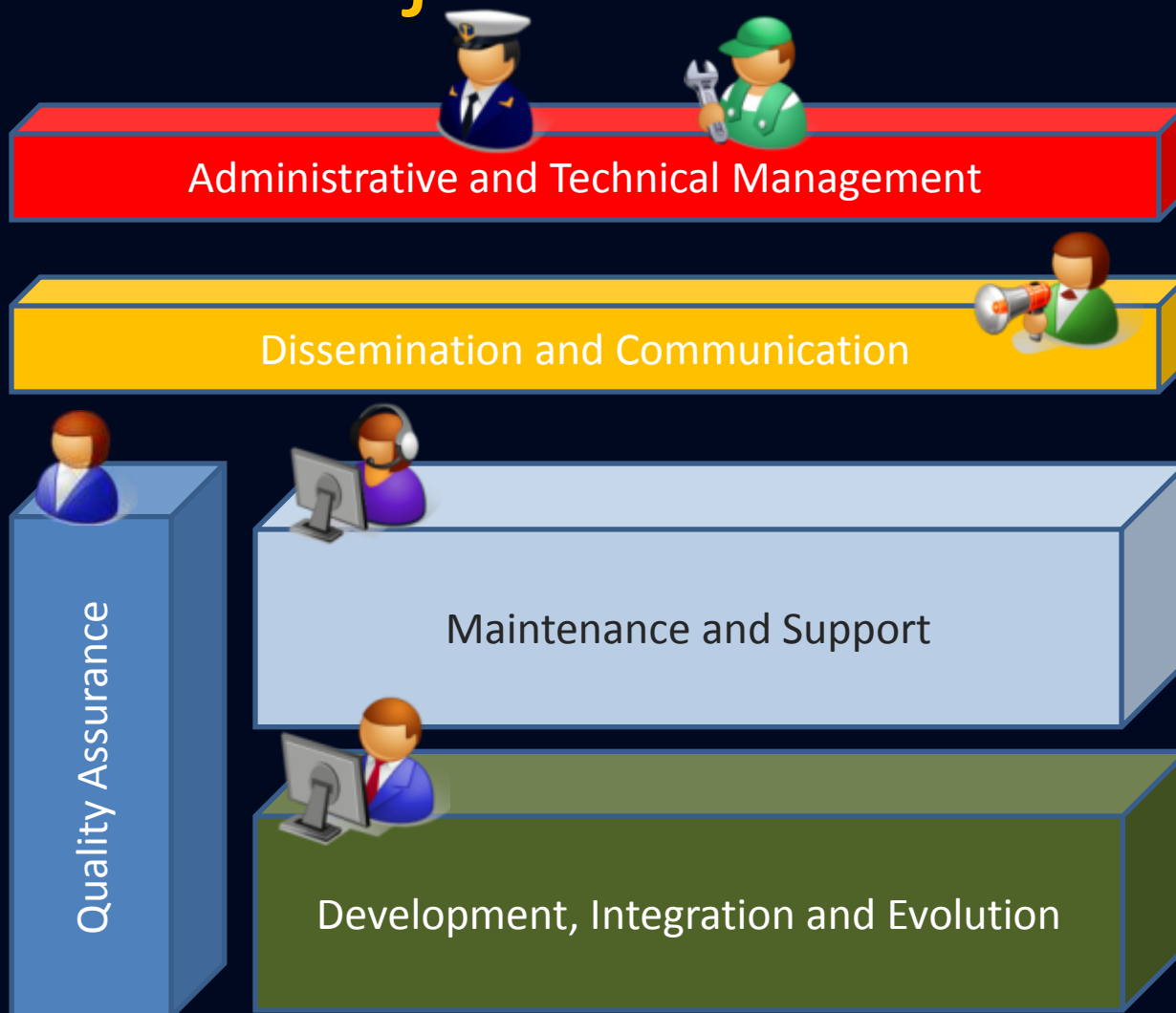
- The sustainability process relies on increased adoption by commercial companies
- EMI has an **'industrial plan'** made of two important points:
 - Work with commercial partners to transfer and integrate technology in both directions
 - Understand with commercial experts what is the market, the realistic targets and the sustainable business models

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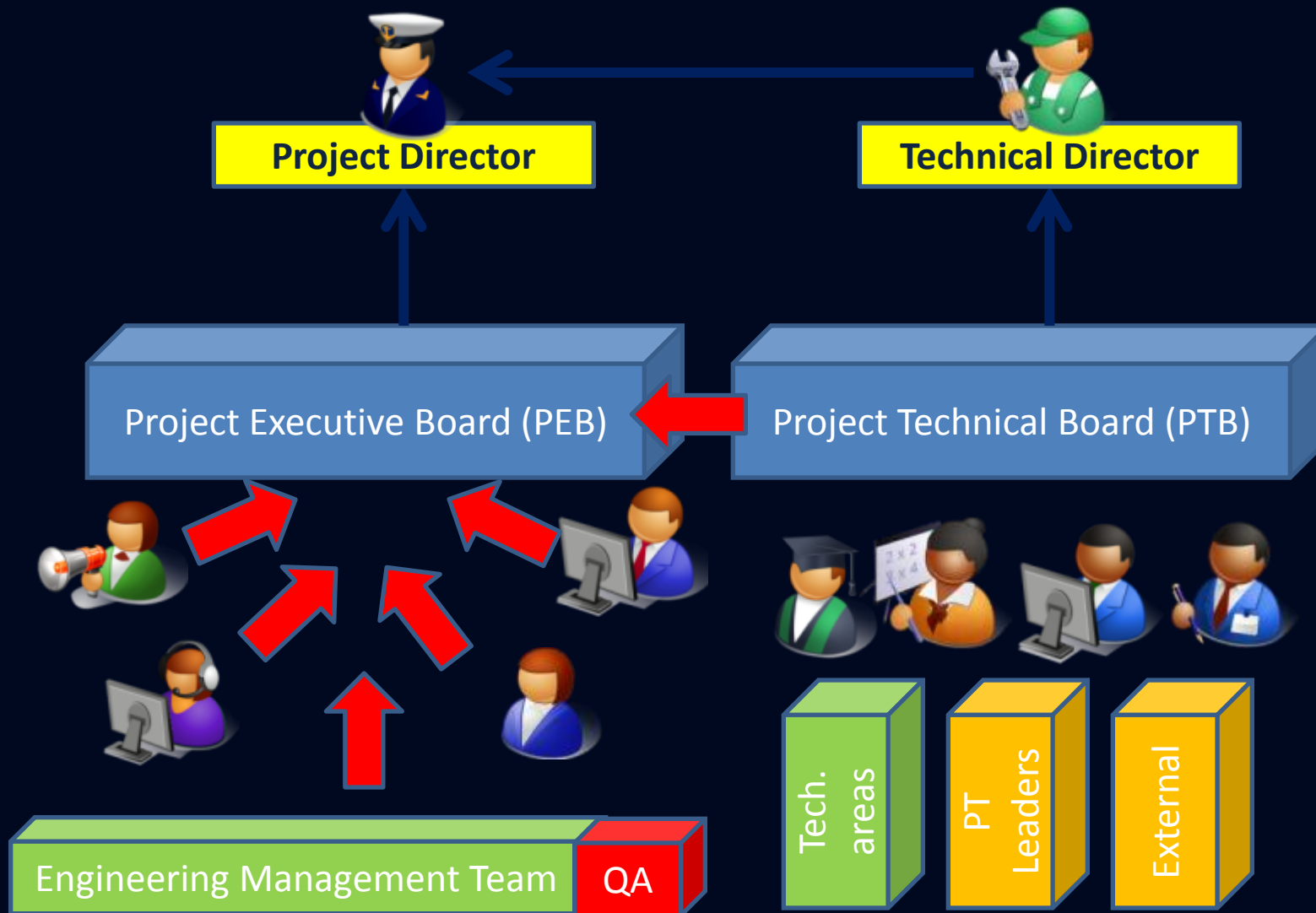
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Project Structure



Project Execution



Technical Areas

Compute Services

A-REX, UAS-Compute, WMS, CREAM, MPI, etc

Data Services

dCache, StoRM, UAS-Data, DPM, LFC, FTS, Hydra, AMGA, etc

Security Services

UNICORE Gateway, UVOS/VOMS/VOMS-Admin, ARGUS, SLCS, glExec, Gridsite, Proxyrenewal, etc

Infrastructure Services

Logging and Bookkeeping, Messaging, accounting, monitoring, virtualization/clouds support, information systems and providers

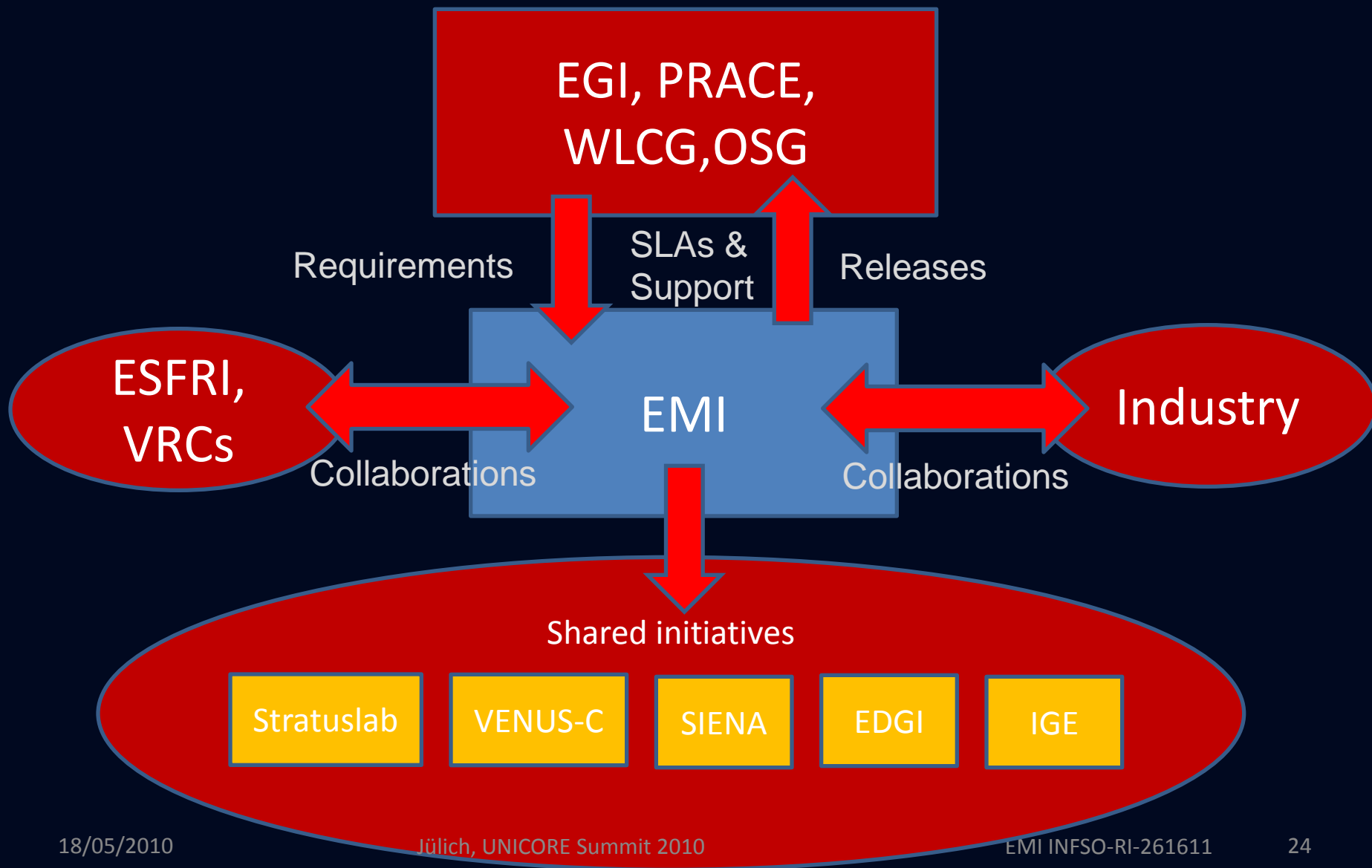
Software Engineering Process

- EMI Software Engineering Process is based on best practices:
 - ITIL and COBIT provide a proven foundation for Release, Change, Problem Management, Quality Assurance and Continual Improvement
- The concept of Product Team is used to clearly allocate tasks and responsibility
 - Each PT is responsible for one or more products from design to after-release user support, including testing and certification
 - Each PT has a Leader responsible for the planning and execution of the tasks delegated to the PT
- Published release policies
 - Periodic major releases of EMI with clear support timelines
 - Individual service or component releases within an EMI major release
 - Guaranteed backward-compatibility of each service within a major release

User Support

- Third-level User Support within the EGI-wide support line
- Technical User Support to ‘customers’ outside the EGI support lines (if necessary)
- Use GGUS as unique entry point for ‘incident management’ (user tickets)
- Response times defined by Service Level Agreements

Collaborations



Workplan

- Year 1
 - Mostly focused on security, consolidation of services and libraries, usability. First major release at the end of the year (technical preview around PM6)
- Year 2
 - Mostly focused on messaging services, integration of virtualization technology and standardization of interfaces. Second major release at the end of the year
- Year 3
 - New requirements, revision or business and exploitation plans
- Sustainability vision after project end
 - User-friendly, standard-based middleware is deployed through mainstream OS distributions and supported also by commercial companies

EMI and UNICORE

- UNICORE brings into EMI essential contributions
 - Its existing expertise with HPC production services
 - Expertise in standardization and interoperability
 - UNICORE has been traditionally very active in standardization activities with leading roles in OGF and more recently PGI
 - Important interoperability use cases between HTC and HPC have been investigated already in the scope of projects like EUFORIA and are essential input for EMI
 - Important experiences with industrial partners
 - Expert effort on developing common security, info systems, messaging and service management technology across all EMI services

Conclusions

- EMI is the new European reference for distributed computing middleware
- It brings together the expertise of the major European middleware providers
- It propose a practical, but ambitious plan to shape the future of European middleware to empower EGI, PRACE and the research infrastructures at large
- Everybody is welcome to collaborate



Thank you

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